**CLAIMS** 1 2 3

WHAT IS CLAIMED IS:

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- A method of producing a grating in a selected portion of an optical fiber, the method comprising the steps of:
  - a) placing the selected portion of the optical fiber in a hydrogen containing atmosphere;
  - b) heating the volume of the hydrogen-containing atmosphere immediately surrounding only the selected portion of the optical fiber to a temperature of at least 250°C; and
  - c) exposing only the selected portion of the optical fiber to the heated volume of the hydrogen-containing atmosphere at a temperature of at least 250°C for a predetermined time.
- 2. The method of claim 1, further comprising the step of exposing the selected portion to a pattern of actinic radiation.
- 3. The method of claim 1, further comprising the step of advancing the selected portion of the optical fiber out of the loading chamber after the exposing step.
- 4. The method of claim 1, further comprising the step of rapidly cooling the selected 1 portion after the step of exposing. 2
- 5. The method of claim 1, wherein the optical fiber has a first selected portion and a 1
- second selected portion, further comprising the step of advancing a second selected 2
- portion of the optical fiber into the loading chamber after the exposing step has been 3
- completed for the first selected portion. 4
- 6. The method of claim 5, further comprising the step of repeating steps a through c for the 1 2 second selected portion of optical fiber.
- 7. The method of claim 1, the optical fiber having a depolymerizable coating, further 1
- comprising heating the selected portion of the fiber and depolymerizing the coating of 2
- 3 the selected portion.
- 8. The method of claim 7, further comprising the step of placing the selected portion of the 1 coating in an oxygen-free atmosphere. 2
- 9. The method of claim 8, wherein the atmosphere comprises inert gases. 1

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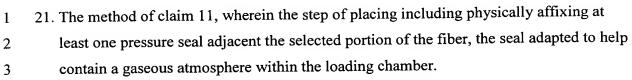
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- 10. The method of claim 1, wherein the optical fiber is loaded into a reel to reel inline system.
- 1 M. A method for increasing the photosensitivity of a selected portion of an optical fiber, the
  2 method comprising the steps of:
  - a) placing at least the selected portion of the optical fiber in a hydrogen containing atmosphere;
  - b) heating the volume of the hydrogen-containing atmosphere immediately surrounding only the selected portion of the optical fiber to a temperature of at least 250°C; and
  - exposing only the selected portion of the optical fiber to the heated volume of the hydrogen-containing atmosphere at a temperature of at least 250°C for a predetermined time.
  - 12. The method of claim 11, wherein only the selected portion of the optical fiber is placed in the hydrogen-containing atmosphere.
  - 13. The method of claim 11, wherein the step of placing includes placing at least the selected portion of the optical fiber in a loading chamber, the method further comprising the step of rapidly changing the atmosphere surrounding the selected portion after the exposing step.
  - 14. The method of claim 13, wherein the step of rapidly changing the atmosphere includes venting the hydrogen-containing atmosphere from the loading chamber.
- 1 15. The method of claim 13, wherein the step of changing the atmosphere includes 2 removing the selected portion from the loading chamber.
- 1 16. The method of claim 11, further comprising the step of rapidly cooling the selected portion of the optical fiber after the predetermined time.
- 1 17. The method of claim 16, wherein the step of cooling includes replacing the hydrogen containing atmosphere with a cooled inert gas.
- 1 18. The method of claim 16, wherein the step of cooling includes placing the selected portion in a cooling region.
- 1 19. The method of claim 11, further comprising the step of physically affixing to the optical
- 2 fiber at least one pressure seal adapted to help contain a gaseous atmosphere within the
- 3 loading chamber
- 20. The method of claim 19, wherein the at least one pressure seal is located at a boundary
- between the selected portion of the optical fiber and a non-selected portion.

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- 22. The method of claim 11, wherein at least one re-closable seal is in contact with the optical fiber during the exposing step.
- 23. The method of claim 22, wherein the at least one re-closable seal is located at a
   boundary between the selected portion of the optical fiber and a non-selected portion.
  - 24. The method of claim 22, wherein the at least one re-closable seal comprises an elastomeric collet.